

Remarks

Reconsideration of this Application is respectfully requested.

Claims 1-11 are pending in the application, with claims 1 and 9 being the independent claims. Claims 1 and 9 are sought to be amended. Claims 12 and 13 are sought to be added. Claims 2 and 5 are sought to be cancelled. Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 1, 8, and 9

Claims 1, 8, and 9 were rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by U.S. Patent No. 5,875,457 to Shalit (hereinafter Shalit). Applicants respectfully traverse the rejection and request that it be withdrawn.

To expedite prosecution, Applicants have amended claims 1 and 9 to include the features previously recited in claim 5. In view of this amendment, claim 5 is cancelled. However, Applicants reserve the right to pursue any subject matter disclosed by the originally filed claims 1 and 9 in a continuation application.

Independent claim 1, as amended, recites, among other features, "initializing the spare space to all zero data;"

On page 9 of the Office Action, the Examiner conceded that Shalit does not teach or suggest "initializing the spare space to all zero data." Accordingly, Claim 1 is patentable over Shalit for at least this reason.

Claims 5 was rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of U.S. Patent No. 5,524,204 to Verdoorn, Jr. (hereinafter Verdoorn).

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Applicants respectfully traverse this rejection if the Examiner applies it to amended claim 1.

In rejecting claim 5, the Examiner acknowledged that Shalit does not teach or suggest "initializing the spare space to all zero data." However, the Examiner contends that Verdoorn discloses this feature. Specifically, the Examiner cited Fig. 3C, items 326 and 328. Applicants respectfully disagree with the Examiner's position. Nowhere in Verdoorn is it disclosed that free space or spare space is being initialized to zero. Further, at item 326 of Verdoorn, the following step is performed, "[w]hen IL is not equal to KN, then the array controller writes zeros to all data blocks KN+1 through IL." Applicants note that K is the number of row in the RAID set. *See* Col. 3, lines 39-40. N equals the number "of DASDs (disks) assumed to contain useful data" *See* Col. 3, lines 38. As such, KN is the total number of data blocks (row times column) that includes data, not just empty or spare space. *See* FIG 1. Accordingly, claim 1 is believed to be patentable over Shalit and Verdoorn, whether considered alone or in any rational combination, for at least the reasons presented above.

Claim 8 depends on claim 1 and is thus patentable over Shalit, considered alone or in combination with Verdoorn, for at least the reasons presented above.

Independent claim 9 is also patentable over Shalit, considered alone or in combination with Verdoorn, for at least the reasons presented with respect to claim 1. Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of claims 1, 8 and 9.

Rejections Under 35 U.S.C. § 103

Claims 2 and 4

Claims 2 and 4 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of U.S. Patent No. 5,615,352 to Jacobson *et al.* (hereinafter Jacobson). As mentioned, claim 2 is sought to be cancelled and its features have been incorporated into new claims 12 and 13. Applicants respectfully traverse the rejection of claim 4. Applicants also traverse this rejection if it is applied to new claims 12 and 13.

In rejecting claim 2, the Examiner acknowledged that Shalit does not teach or suggest "allocating the spare space on a dedicated spare disk drive." The Examiner asserted that Jacobson allegedly teaches this limitation. Specifically, the Examiner cited Figure 1, item 31 (spare disk drives) of Jacobson and argued that Jacobson "explicitly teach[es] the use of dedicated spare disk drive to support a method of adding storage disks . . . while maintaining data availability." Applicants respectfully disagree for several reasons.

First, nowhere is it mentioned in Jacobson that free space is to be allocated among the original RAID set and specifically to a spare disk drive among the original RAID set. An original RAID set is a set of drives prior to the expansion. Secondly, the spare disk drives of Jacobson (Fig. 1, item 31) is actually part of the expansion set of disk drives and not part of the original RAID set. According to Col. 11, lines 20-23, of Jacobson, "[t]o enlarge the storage capacity of the data system, one or more spare disks 33 are simply plugged into available bays to interface with SCSI bus. The controller will recognize the new disk(s) and begin . . . to assimilate the additional storage space into

usable RAID areas." Thus the spare disk 31 of Jacobson is not a dedicated spare disk drive of the original RAID set. Accordingly, for at least the reasons provided above, neither Shalit nor Jacobson, alone or in combination, teaches or suggests "allocating the spare space on a dedicated spare disk drive" as recited in claim 12 and 13. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 2 if it is applied to new claims 12 and 13.

In rejecting claim 4, the Examiner acknowledged that Shalit does not teach or suggest that "new data be mapped redundantly." The Examiner asserted that Jacobson allegedly teaches this limitation. Applicants respectfully disagree.

Nowhere in Jacobson is it disclosed that new data be redundantly mapped as asserted by the Office Action. In fact Jacobson only mirrors certain data. Specifically, only most frequently accessed or recently accessed data are mirrored in Jacobson. *See* Col. 7, lines 29-39. Further, frequently or recently accessed data in Jacobson can only be old data because Jacobson does not specifically address whether new data can be written into the original RAID array during the RAID expansion process. Accordingly, neither Shalit nor Jacobson, considered alone or in any rational combination, teaches or suggests mapping new data redundantly as recited by claim 4.

Applicants therefore respectfully request that the Examiner reconsider and withdraw the rejection of claims 2 and 4.

Claim 3

Claim 3 was rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of U.S. Patent No. 6,067,635 to DeKoning *et al.* (hereinafter DeKoning). Applicants respectfully traverse the rejection and request it be withdrawn.

Claim 3 depends from independent claim 1 and is thus patentable over Shalit and DeKoning for at least for the reasons set forth above with respect to claim 1. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claim 3.

Claims 5-7

Claims 5-7 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of U.S. Patent No. 5,524,204 to Verdoorn, Jr. (hereinafter Verdoorn). Applicants respectfully traverse the rejection with respect to claims 6-7 and request it be withdrawn.

The rejection of claim 5 has been dealt with above with respect to amended claim 1.

Claim 6 depends from independent claim 1 and is thus patentable over Shalit and Verdoorn, considered alone or in combination, for at least for the reasons set forth above with respect to claim 1.

In rejecting claim 7, the Examiner acknowledged that Shalit does not teach or suggest "initializing at least one new disk drive." The Examiner contends that Verdoorn discloses this feature. Specifically, the Examiner cited Fig. 3A, item 302. Applicants respectfully disagree with the Examiner's position for several reasons.

First, item 302 does not actually initialize the array. Rather it "establish[es] an initial array state." *See* Col. 4, lines 42-43. Further, this step is performed on the original RAID set and not on a new disk. This is clearly stated at Col. 4, lines 42-45, "to establish an initial array state . . . to provide logical to physical address conversion for all NK data blocks in the array 12." The array 12 is original RAID set. *See* Fig. 1. Accordingly, claim 7 is patentable over Shalit and Verdoorn, considered alone or in

combination, for at least the reason presented above. Applicants therefore request that the Examiner reconsider and withdraw the rejection of claims 6-7.

Claims 10-11

Claim 10 was rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of DeKoning and further in view of Jacobson. Claim 11 was rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Shalit in view of Jacobson and further in view of Verdoorn. Applicants respectfully traverse these rejections and request they be withdrawn.

Claim 10 depends from independent claim 9 and is thus patentable over Shalit and Dekoning for at least for the reasons provided above with respect to claim 9. Claim 10 is also patentable over Shalit, DeKoning, and Verdoorn for at least the reasons presented with respect to claim 7.

Claim 11 is patentable over Shalit, DeKoning, and Verdoorn for at least the reasons presented with respect to claims 2 and 7. Accordingly, Applicants request that the Examiner reconsider and withdraw the rejection of claims 10 and 11.

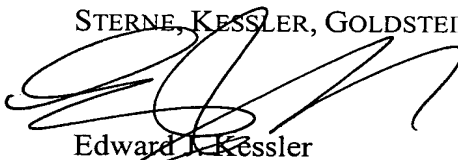
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Date: 17 Aug. 2005

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Atty. Docket: 1875.5930000